Claims:

1. A method of controlling a cross-sectional asymmetric condition of a laminar flowing material, the method comprising:

(a) providing a hot runner system, the hot runner system having an upstream melt passage, a plurality of intermediary melt passages downstream from the upstream melt passage, and for at least one of the intermediary melt passage, an associated pair of downstream melt passages downstream from the intermediary melt passage;

(b) providing the laminar flowing material to the hot runner system; and,

(c) heating the laminar flowing material within the hot runner system; and,

(d) for the at least one intermediary melt passage, orienting one of (i) the cross-sectional asymmetric condition of the laminar flowing material in the intermediary melt passage, and (ii) the associated plurality of downstream melt passages, such that the cross-sectional asymmetric condition is substantially equally divided between the associated two downstream melt passages.

2. The method as defined in claim 1 wherein step (d) comprises orienting one of (i) the cross-sectional asymmetric condition of the laminar flowing material in the at least one intermediary melt passages and (ii) the associated pair of downstream melt passages, relative to the other.

3. The method as defined in claim 1 wherein for the at least one intermediary melt passage, step (d) comprises orienting the associated pair of downstream melt passages relative to the upstream melt passage and the intermediary melt passage such that the upstream melt passage, the intermediary melt passage and the associated pair of downstream melt passages are not coplanar.

4. The method as defined in claim 1 wherein step (a) comprises providing a manifold having the hot runner system.

5. The method as defined in claim 1 wherein step (a) comprises providing a stack mold having the hot runner system.

6. The method as defined in claim 1 wherein step (d) comprises rotating the cross-sectional asymmetric condition of the laminar flowing material in the at least one intermediary melt passage, such that the cross-sectional asymmetric condition is substantially equally divided between the associated two downstream melt passages.

7. The method as defined in claim 6 wherein step (d) comprises rotating the cross-sectional asymmetric condition of the laminar flowing material in the at least one intermediary melt passage by providing a sufficient amount of bending in the at least one intermediary melt passage.

8. An injection molding apparatus comprising:

(a) a hot runner system for supplying a laminar flowing material, the hot runner system having

(i) an upstream melt passage,

(ii) a plurality of intermediary melt passages downstream from the upstream melt passage, and

(iii) for at least one intermediary melt passage, an associated pair of downstream melt passages downstream from the intermediary melt passage;

(b) for the upstream melt passage and the at least one intermediary melt passage, a flow path for orienting the cross-sectional asymmetric condition of the laminar flowing material in the at least one intermediary melt passage such that the cross-sectional asymmetric condition

is substantially equally divided between the associated pair of downstream melt passages; and,

(c) a plurality of hot runner nozzles in communication with and downstream from the downstream melt passages.

9. The injection molding apparatus as defined in claim 8 further comprising a manifold having the hot runner system.

10. The injection molding apparatus as defined in claim 8 further comprising a stack mold having the hot runner system.

11. The injection molding apparatus as defined in claim 8 wherein the flow path is non-planar.

12. The injection molding apparatus as defined in claim 11 wherein the flow path comprises a sufficient amount of bending to rotate the cross-sectional asymmetric condition of the laminar flowing material in the at least one intermediary melt passage such that the cross-sectional asymmetric condition is substantially equally divided between the associated pair of downstream melt passages.

13. The injection molding apparatus as defined in claim 8 further comprising a flow rotator for installing in the hot runner system to provide a bending portion of the flow path.

14. The injection molding apparatus as defined in claim 13 wherein the bending portion comprises a sufficient amount of bending to rotate the cross-sectional asymmetric condition of the laminar flowing material in the at least one intermediary melt passage such that the cross-sectional asymmetric condition is substantially equally divided between the associated pair of downstream melt passages.

15. The injection molding apparatus as defined in claim 13 wherein

the flow rotator receives the laminar flowing material from the upstream melt passage;

the bending portion comprises a pair of downstream outlets and a branch for bifurcating the bending portion into the pair of downstream outlets;

the pair of downstream outlets comprises a distinct associated downstream outlet for the at least one intermediary melt passage;

for the at least one intermediary melt passage, the distinct associated downstream outlet discharges the laminar flowing material into the intermediary melt passage; and,

for the at least one intermediary melt passage, the distinct associated downstream outlet is oriented relative to the intermediary melt passage to rotate the cross-sectional asymmetrical condition of the laminar flowing material such that the cross-sectional asymmetric condition is substantially equally divided between the associated two downstream melt passages.

16. The injection molding apparatus as defined in claim 13 wherein the flow-rotator receives the laminar flowing material from the intermediary melt passage and discharges the laminar flowing material into the intermediary melt passage.

17. The injection molding apparatus as defined in claim 13 wherein

the flow rotator comprises a one-piece body having an inlet for receiving the laminar flowing material and at least one outlet for discharging the laminar flowing material, the inlet being connected to the outlet by the curved path; and,

the one-piece body is configured such to fit within the hot runner system.

18. The injection molding apparatus as defined in claim 17 wherein the one-piece body comprises an integral heating element.

19. In a hot runner system for supplying a laminar flowing material, the hot runner system having (i) an upstream melt passage, (ii) a pair of intermediary melt passages downstream from the upstream melt passage, and (iii) for at least one intermediary melt passage, an associated pair of downstream melt passages downstream from the at least one intermediary melt passage; a flow-rotator for rotating a cross-sectional asymmetrical condition of a laminar flowing material in the hot runner system, the flow rotator comprising:

(a) an inlet for receiving the laminar flowing material;

(b) at least one outlet for discharging the laminar flowing material; and,

(c) a bending path for orienting the at least one outlet relative to the inlet to rotate the cross-sectional asymmetrical condition of the laminar flowing material such that the cross-sectional asymmetrical condition is substantially equally divided between the two downstream portions.

20. The flow rotator as defined in claim 19 wherein the at least one outlet

is positioned to discharge the laminar flowing material into the at least one intermediary melt passages, and

is oriented relative to the at least one intermediary melt passage such that the cross-sectional asymmetrical condition in the at least one intermediary melt passage is substantially equally divided between the associated pair of downstream melt passages.

21. The flow rotator as defined in claim 19 wherein

the at least one outlet comprises a pair of outlets; and,

each outlet in the pair of outlets, is positioned to discharge the laminar flowing material into an associated intermediary melt passage in the pair of intermediary melt passages, and is oriented relative to the associated intermediary melt passage such that the cross-sectional asymmetrical condition in the associated intermediary melt passage is substantially equally divided between the associated pair of downstream melt passages.

22. The flow rotator as defined in claim 19 wherein the bending path is offset from a plane including the upstream melt passage, the pair of intermediary melt passages downstream from the upstream melt passage, and the associated pair of downstream melt passages for each intermediary melt passage.

23. The flow rotator as defined in claim 19 wherein the bending path comprises a sufficient amount of bending to rotate the cross-sectional asymmetrical condition such that the cross-sectional asymmetrical condition is substantially equally divided between the two downstream portions.

24. The flow rotator as defined in claim 19 further comprising a one-piece body, wherein the inlet, the branch, the bending path and the two outlets are formed in the one-piece body.

25. The flow rotator as defined in claim 24 wherein the one-piece body comprises an integral heating element.